

What is claimed is:

1. A multi-line selection driving method of a driving unit of a super-twisted nematic liquid crystal display for simultaneously selecting four row-lines to drive the super-twisted nematic liquid crystal display, the method comprising:

5 receiving input image data;

generating predetermined column signal functions for selected row lines, the predetermined column signal functions having different digital values according to on/off states of corresponding pixels of the super-twisted nematic liquid crystal display;

10 generating predetermined row signal functions for the selected row lines, the predetermined row signal functions having different digital values according to negative/positive states of corresponding row signals;

determining a dot product value of respective pairs the predetermined column signal functions and the predetermined row signal functions to determine a mismatch value between a column signal function and a row signal function;

15 determining a total number of mismatch values corresponding to the row signals and column signals to be applied sequentially to the super-twisted nematic liquid crystal display;

20 generating first predetermined column signal voltages in a first driving time period determined according to the total number of mismatch values, and applying the first predetermined column signal voltages in the first driving time period to corresponding column lines when the row signals are input to the four row lines during the first driving time period; and

25 generating second predetermined column signal voltages in a second driving time period determined according to the total number of mismatch values, and applying the second predetermined column signal voltages in the second driving time period to corresponding column lines when the row signals are input to the four row lines during the second driving time period.

30 2. The multi-line selection driving method of claim 1, wherein the predetermined column signal voltages in the first driving time period include column signal voltages with three levels, and the predetermined column signal voltages, MV2, MV2, VM, V2,

and V2, corresponding to the total number of mismatch values, 0, 1, 2, 3 and 4, respectively.

3. The multi-line selection driving method of claim 2, wherein a difference
5 between MV2 and VM is substantially the same as a difference between VM and V2.

4. The multi-line selection driving method of claim 1, wherein the predetermined
column signal voltages in the second driving time period include column signal voltages
with three levels, and the predetermined column signal voltages, MV2, VM, VM, VM,
10 and V2, corresponding to the total number of mismatch values, 0, 1, 2, 3, and 4,
respectively.

5. The multi-line selection driving method of claim 4, wherein a difference
between MV2 and VM is substantially the same as a difference between VM and V2.
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6. The multi-line selection driving method of claim 1, wherein the first driving
time period and the second driving time period have the same time length.

7. The multi-line selection driving method of claim 1, wherein the first and
20 second driving time periods are determined by the Equation,

$$T1 : T2 = (2b+1) : (2b+3)$$

$$B = VR/VC,$$

wherein T1 is the first driving time period, T2 is the second driving time period, VR is an
absolute value of a row signal voltage and VC is 1/2 of the difference of two levels
25 among the column signal voltages with three levels.

8. A program storage device readable by machine, tangibly embodying a
program of instructions executable by the machine to perform method steps for
simultaneously selecting four row-lines to drive the super-twisted nematic liquid crystal
30 display, the method steps comprising:

receiving input image data;

generating predetermined column signal functions for selected row lines, the predetermined column signal functions having different digital values according to on/off states of corresponding pixels of the super-twisted nematic liquid crystal display;

generating predetermined row signal functions for the selected row lines, the
 5 predetermined row signal functions having different digital values according to negative/positive states of corresponding row signals;

determining a dot product value of respective pairs the predetermined column signal functions and the predetermined row signal functions to determine a mismatch value between a column signal function and a row signal function;

10 determining a total number of mismatch values corresponding to the row signals and column signals to be applied sequentially to the super-twisted nematic liquid crystal display;

generating first predetermined column signal voltages in a first driving time period determined according to the total number of mismatch values, and applying the first
 15 predetermined column signal voltages in the first driving time period to corresponding column lines when the row signals are input to the four row lines during the first driving time period; and

generating second predetermined column signal voltages in a second driving time period determined according to the total number of mismatch values, and applying
 20 the second predetermined column signal voltages in the second driving time period to corresponding column lines when the row signals are input to the four row lines during the second driving time period.

9. The multi-line selection driving method of claim 8, wherein the predetermined
 25 column signal voltages in the first driving time period include column signal voltages with three levels, and the predetermined column signal voltages, MV2, VM, V2, and V2, corresponding to the total number of mismatch values, 0, 1, 2, 3 and 4, respectively,.

30 10. The multi-line selection driving method of claim 9, wherein a difference between MV2 and VM is substantially the same as a difference between VM and V2.

11. The multi-line selection driving method of claim 8, wherein the predetermined column signal voltages in the second driving time period include column signal voltages with three levels, and the predetermined column signal voltages, MV2, VM, VM, VM, and V2, corresponding to the total number of mismatch values, 0, 1, 2, 3, and 4, respectively.

12. The multi-line selection driving method of claim 11, wherein a difference between MV2 and VM is substantially the same as a difference between VM and V2.

13. The multi-line selection driving method of claim 8, wherein the first driving time period and the second driving time period have the same time length.

14. The multi-line selection driving method of claim 8, wherein the first and second driving time periods are determined by the Equation,

$$T1 : T2 = (2b+1) : (2b+3)$$

$$B = VR/VC,$$

wherein T1 is the first driving time period, T2 is the second driving time period, VR is an absolute value of a row signal voltage and VC is 1/2 of the difference of two levels among the column signal voltages with three levels.